

Claim PTO/tw

8-10-04

1. A receiver for digital broadcasting comprising:
receiving circuits configured to receive a plurality of digital broadcasting waves at the same time, wherein one of the plurality of digital broadcasting signals being selected for providing output from the receiver, and each digital broadcasting wave including synchronization signals;
a synchronization detector configured to detect the synchronization signals of the plurality of digital broadcasting waves; and
circuits configured to estimate an undetected one of the synchronization signals in the selected one of the plurality of digital broadcasting waves according to the synchronization signals detected by the synchronization detector.
2. The receiver according to Claim 1, wherein the undetected one of the synchronization signals in the selected one of the plurality of digital broadcasting waves is determined according to previously detected synchronization signals of the plurality of digital broadcasting waves and a presently detected synchronization signal of other one of the plurality of digital broadcasting waves.
3. The receiver according to Claim 1, wherein each of the plurality of digital broadcasting waves includes a format comprising a plurality of frames, and each of the plurality of frames includes one of the synchronization signals and one of information data signals.
4. The receiver according to Claim 3, further comprising a timing signal generator to decode the information data signals; wherein the timing signal generator generates timing signals according to the synchronization signals detected by the synchronization detector.
5. The receiver according to Claim 4, further comprising a data extractor, wherein the data extractor extracts the information data signals according to the timing signals.
6. The receiver according to Claim 5, further comprising a data decoder of the information data signals.
7. The receiver according to Claim 6, further comprising a selector for selecting the selected one of the plurality of digital broadcasting waves, wherein an output signal of the selector is applied to the data decoder.

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8. The receiver according to Claim 1, wherein the circuits configured to estimate further comprise a memory, in which a time difference between one of the synchronization signals previously detected in the selected one of the plurality of digital broadcasting waves and one of the synchronization signals previously detected in other one of the plurality of digital broadcasting waves is stored, wherein the circuits estimate the undetected synchronization signal according to the time difference and a presently detected synchronization signal of the other one of the plurality of digital broadcasting waves.

9. The receiver according to Claim 1, wherein time differences between one of the synchronization signals previously detected in the selected one of the plurality of digital

receiving means for receiving a plurality of digital broadcasting waves at the same time, wherein one of the plurality of digital broadcasting signals being selected for providing output from the receiver, and each broadcasting wave including synchronization signals;

synchronization detector means for detecting the synchronization signals of the plurality of digital broadcasting waves; and

estimate means for estimating an undetected one of the synchronization signals in the selected one of the plurality of digital broadcasting waves according to the synchronization signals detected by the synchronization detector means

14. The receiver according to Claim 13, wherein the estimate means determines the undetected one of the synchronization signals in the selected one of the plurality of digital broadcasting waves based on previously detected synchronization signals of the plurality of digital broadcasting waves and a presently detected synchronization signal of other one of the plurality of digital broadcasting waves.

15. The receiver according to Claim 13, wherein each one of the plurality of digital broadcasting waves has a format comprising a plurality of frames, and each of the plurality of frames has at least one of the synchronization signals and one of information data signals.

16. The receiver according to Claim 15, further comprising timing signal generator means for generating timing signals according to detected synchronization signals.

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17. The receiver according to Claim 16, further comprising data extractor means for extracting the information data signals according to the timing signals.

18. The receiver according to Claim 17, further comprising data decoder means for decoding the information data signals.

19. The receiver according to Claim 18, further comprising selector means for selecting the selected one of the plurality of digital broadcasting waves, wherein an output signal of the selector means is applied to the data decoder means.

20. The receiver according to Claim 13, further comprising a memory means, in which a time difference between one of the synchronization signals previously detected in the selected one of the plurality of digital broadcasting waves and one of the synchronization signal previously detected in other one of the plurality of digital broadcasting waves is stored, wherein the estimate means estimates the undetected synchronization signal according to the time difference and a presently detected synchronization signal of the other one of the plurality of digital broadcasting waves.

21. The receiver according to Claim 13, wherein time differences between one of the synchronization signals previously detected in the selected one of the plurality of digital broadcasting waves and the synchronization signals previously detected in other ones of the plurality of digital broadcasting waves are stored, and the estimate means estimates the undetected synchronization signal according to the time differences and presently detected synchronization signals of the other ones of the plurality of digital broadcasting waves.

22. The receiver according to Claim 13, wherein the estimate means further comprising calculating means for calculating an average value of synchronization timings previously detected in the plurality of digital broadcasting waves and a time difference from the average value, and the estimate means estimates the undetected synchronization signal according to the average value and the time difference.

23. The receiver according to Claim 20, wherein the time difference is stored as a form of relative time difference between the one of synchronization signals previously detected in the selected one of the plurality of digital broadcasting waves and the one of the synchronization signals previously detected in other ones of the plurality of digital broadcasting waves.

24. The receiver according to Claim 21, wherein the time differences are stored as a form of relative time difference between the one of the synchronization signals previously detected in the selected one of the plurality of digital broadcasting waves and each of the synchronization signals previously detected in other ones of the plurality of digital broadcasting waves.

25. A method for receiving digital broadcasting, comprising the steps of:
receiving a plurality of digital broadcasting waves at the same time, wherein one of the plurality of digital broadcasting signals being selected for providing output from the receiver, and each broadcasting wave including synchronization signals;

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detecting the synchronization signals of the plurality of digital broadcasting waves; and

estimating an undetected synchronization signal in the selected one of the plurality of digital broadcasting waves according to the synchronization signals detected by the detecting step.

26. The method according to Claim 25, wherein the estimating step includes estimating the undetected synchronization signal according to previously detected synchronization signals of the plurality of digital broadcasting waves and a presently detected synchronization signal of other one of the plurality of digital broadcasting waves.

27. The method according to Claim 25, wherein each of the plurality of digital broadcasting waves includes a format comprising a plurality of frames, and each of the plurality of frames includes one of the synchronization signals and one of information data signals.

28. The method according to Claim 27, further comprising a timing signal generating step for decoding the information data signals, wherein the timing signal generating step generates the timing signals according to the synchronization signals detected by the synchronization detector.

29. The method according to Claim 28, further comprising a data extracting step for extracting the information data signals according to the timing signals.

30. The method according to Claim 29, further comprising a data decoding step for decoding of the information data signals.

31. The method according to Claim 30, further comprising a selecting step for selecting the selected one of the plurality of digital broadcasting waves, wherein an output signal resulting from the selecting step is applied to the data decoding step.

32. The method according to Claim 25, wherein the estimating step further comprises a memorizing step, in which a time difference between one of the synchronization signals previously detected in the selected one of the plurality of digital broadcasting waves and one of the synchronization signals previously detected in other one of the plurality of digital broadcasting waves is stored, wherein the estimating step estimates the undetected synchronization signal according to the time difference and a presently detected synchronization signal of the other one of the plurality of digital broadcasting waves.

33. The method according to Claim 25, wherein time differences between one of the synchronization signals previously detected in the selected one of the plurality of digital broadcasting waves and the synchronization signals previously detected in other ones of the plurality of digital broadcasting waves are stored, and the estimating step estimates the undetected synchronization signal according to the time differences and presently detected synchronization signals of the other ones of the plurality of digital broadcasting waves.

34. The method according to Claim 25, wherein the estimating step further comprising calculating an average value of synchronization timings previously detected in the

plurality of digital broadcasting waves and a time differences from the average value, and the estimate step estimates the undetected synchronization signal at least according to the average value and the time difference.

35. The method according to Claim 32, wherein the memorizing step stores the time difference as a form of relative time difference between the one of the synchronization signals previously detected in the selected one of the plurality of digital broadcasting waves and the one of the synchronization signals previously detected in other ones of the plurality of digital broadcasting waves.

36. The method according to Claim 33, wherein the memorizing step stores the time differences as a form of relative time differences between the one of the synchronization signal previously detected in the selected one of the plurality of digital broadcasting waves and each of the synchronization signals previously detected in other ones of the plurality of digital broadcasting waves.